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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/202,267	12/09/1998	TAKAO NISHIKAWA	P3297B	2673

20178 7590 10/22/2002

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EXAMINER

TUGBANG, ANTHONY D

ART UNIT	PAPER NUMBER
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3729

DATE MAILED: 10/22/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/202,267

Applicant(s)

NISHIKAWA ET AL.

Examiner

Dexter Tugbang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 July 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) 5,11-13,15-17,21,27-29 and 31-33 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4,6-10,14,18-20,22-26 and 30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Continued Prosecution Application

1. The request filed on 7/31/02 for a Continued Prosecution Application (CPA) under 37 CFR 1.53(d) based on parent Application No. 09/202,267 is acceptable and a CPA has been established. An action on the CPA follows.

Election/Restrictions

2. Claims 5, 11-13, 15-17, 21, 27-29 and 31-33 continue to stand as being withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 11.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-4, 6-10 and 14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In Claim 1, it is unclear if the phrase of "said green sheet having a relief pattern in response to the concave portion" (lines 5-6) is referring to the previous phrase of "a green sheet having a prescribed relief pattern in response to said head base" (lines 3-4). Particularly, since the "head base comprises...a concave portion" (lines 4-5). How many relief patterns are there?

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Furthermore, which of the above relief patterns is being referred to with “said relief pattern” (lines 8-9).

In Claim 2, further confusion is raised with the phrase of “a prescribed pattern on a substrate of said green sheet” (lines 4-5). Again, how many patterns or relief patterns are there?

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 18-20, 22, 23, 26 and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by Japanese Patent Publication JP 5-286141, referred to hereinafter as JP’141.

JP’141 teaches the claimed *final product* of an ink jet printer head comprising a head base having a concave portion (chambers 12 in Fig. 2) defining pressure chambers and a plate (nozzle plate 10) in which corresponding nozzle ports 11 for discharging the ink on the head base are formed. Claims 18-20, 22, 23, 26 and 30 are interpreted as Product-by-Process Claims. As such, Applicants are referred to MPEP § 2113 which states:

“[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.” *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985)

Regarding Claim 18, the limitations drawn to the green sheet having a relief pattern and the coating and stripping steps have not been given any patentable weight as these limitations do not patentably further limit the claimed product of the ink jet head. The green sheet is not considered even part of the finished product of the ink jet head.

Regarding dependent Claims 19, 20, 22, 23, 26 and 30, the method limitations drawn to the green sheet, as well as imparting energy and a lithographic method, have also not been any patentable weight as these limitations do not patentably further limit the claimed product of an ink jet head.

7. Claims 1-3, 6, 18-20 and 22 are rejected under 35 U.S.C. 102(b) as being anticipated by Japanese Patent Publication JP 4-338550, referred to hereinafter as JP'550.

JP'550 discloses the claimed manufacturing method comprising: manufacturing a green sheet (substrate 20) made of silicon and having a prescribed relief pattern (shown in Fig. 2d) in response to a head base (plate 11); forming the head base 11 by coating and solidifying a material of Ni through electro-deposition; stripping off the head base from the green sheet (shown in Fig. 2g); and forming a nozzle port (curved shaped openings on the top surface of plate 11) for discharging in on the head base. The head base comprises a plate 11, which as nozzle ports (curved shaped openings on the top surface of plate 11) and concave portions (rectangular shaped openings on the bottom surface of plate 11 shown in Fig. 2g) in which the green sheet 20 has a relief pattern (film 23) in response to the concave portion.

Regarding Claim 2, JP'550 also teaches forming a resist layer 22 in response to a prescribed pattern on a substrate 21 of the green sheet 20 and forming the relief pattern on the substrate by etching (see sequence of Figs. 2a-2c).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 4, 7, 14, 23 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP'550 in view of Trueba.

JP'550 teaches the claimed manufacturing method as previously discussed. JP'550 does not teach that the green sheet is made of quartz glass, that the imparted energy is heat, forming the nozzle port specifically by a lithographic method.

Trueba teaches manufacturing techniques that include a peelable green sheet 201 made of glass that is for coating and hardening a material that is electroformed onto the green sheet (see col. 4, lines 10-16 and lines 48-60). Trueba utilizes the combination of both coating, i.e. electroforming, heating by baking to harden the coated material, and a lithographic method of UV light to form nozzle ports in a head base (see sequence of Figs. 2A-2L). One such advantage of utilizing Trueba's manufacturing techniques allows control of the final shape of the workpiece with improved manufacturing tolerances (see col. 3, lines 15-29).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the method of JP'550 by utilizing the manufacturing techniques of Trueba, to positively allow control of the final shape of the head base with improved manufacturing tolerances.

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Regarding Claim 4, it would have been an obvious matter of engineering design choice to choose any desired substrate material of the green sheet, since applicants have not disclosed that the claimed green sheet substrate material of a *quartz glass* solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with the glass substrate material taught by Trueba. The green sheets of both JP'550 and Trueba have the same function of being peelable sheets with the application of a coated and hardened material being formed on the green sheet.

10. Claims 8, 9, 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP'550 in view of Moynihan 5,640,184.

JP'550 teaches the claimed manufacturing method as previously discussed. The modified JP'550 method does not teach that the head base is made of a thermoplastic substance, more specifically a hydrated glass.

Moynihan suggests that a head base can be made from thermoplastic materials of alumina or *glass* to provide the head base material with a thermal expansion coefficient compatible with adjacent components to be used in operation of an ink jet print head (see col. 14, lines 10-18).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the head base of JP'550 by forming the head base with thermoplastic materials of glass, as taught by Moynihan, to positively provide a head base with a thermal expansion coefficient compatible with adjacent components to be used in the operation of the ink jet print head.

It is noted that the Applicants recite specific material limitations in Claims 9 and 25, i.e. that the glass is "hydrated". However, such limitations must result in a manipulative difference

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in the recited process steps as compared to the prior art. In this instance these material limitations are held to be obvious and not given patentable weight in these method of manufacturing claims as such limitation(s) do not result in any difference in the *claimed* manufacturing process.

11. Claims 10 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP'550 in view of Sachdev et al 5,470,693.

JP'550 teaches the claimed manufacturing method as previously discussed. The modified JP'550 method does not teach that the relief pattern has a recess with a tapered shape. The recess of JP'550 appears to have straight vertical walls.

Sachdev teaches a lithographic process in which a resist relief pattern 7 (in Fig. 1C) is formed with a tapered shape. Such an advantage of the tapered profile allows the member being etched under the resist relief pattern to retain a good image profile structure having a high resolution (see col. 8, lines 46-54).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the resist relief pattern of JP'550 by forming a tapered shape, as taught by Sachdev, to advantageously form the layers being etched under the resist relief pattern to retain a good image profile structure having a high resolution.

Response to Arguments

12. Applicant's arguments filed 7/5/02 have been fully considered but they are not persuasive.

In regards to the merits of JP'141, applicants contend that JP'141 does not teach the structure of a head base having a concave portion and nozzle port. That JP'141 only shows a nozzle plate and not a head base.

The examiner most respectfully disagrees. JP'141 does not merely show a nozzle plate but an entire head base (in Fig. 2) with nozzle ports 11 and concave portions (chambers 12). The stripping of the head base has no impact on the final claimed structure. Thus, JP'141 fully satisfies the limitations of Claim 18.

In regards to the merits of Trueba, the applicants' arguments are now considered to be moot in view of the new grounds of rejection set forth above with JP'550.

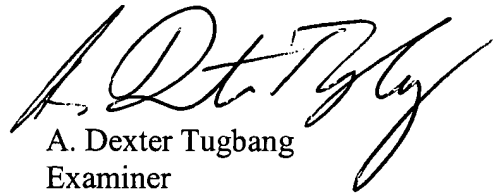
Conclusion

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dexter Tugbang whose telephone number is 703-308-7599. The examiner can normally be reached on Monday - Friday 9:00 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Vo can be reached on 703-308-1789. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-3590 for regular communications and 703-305-3588 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0858.

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A handwritten signature in black ink, appearing to read 'A. Dexter Tugbang', is positioned above the printed name and title.

A. Dexter Tugbang
Examiner
Art Unit 3729

adt

October 19, 2002